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A level playing field: An optimal weighting scheme of dismissal protection characteristics

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Michael Kind

DIW SOEP

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A Level Playing Field – An Optimal Weighting Scheme of Dismissal Protection Characteristics

Abstract

In the case of collective redundancies, employers are forced to regard certain characteristics when deciding who is going to be dismissed. This paper develops a procedure to derive an empirical based weighting scheme between the characteristics relevant for this selection (age, disability, dependencies and tenure). First, panel data from the German Socio-Economic Panel (SOEP) for the years 1991-2010 is used to estimate, conditional on the existence of dismissal protection, the relationships of the four characteristics with respect to reemployment probabilities and the quality of the new job (measured in terms of wage). Second, the individual valuation of the two outcomes is compared applying a life satisfaction analysis. Finally, based on the empirical results a weighting scheme for the characteristics is proposed, which serves as an evidence based guideline for employers, employees and unions in the process of collective redundancies.

JEL Classification: J63, J64

Keywords: Dismissal protection; reemployment probability; wage hit

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1 *RWI and RGS Econ,* *– The author thanks John P. Haisken-DeNew, Jan Kleibrink, Maren M. Michaelsen, Ingo Isphording and Matthias Giesecke for helpful comments and suggestions.* *– All correspondence to: Michael Kind, RGS Econ, RWI, Hohenzollernstr. 1-3, 45128 Essen, Germany. E-Mail: Michael.Kind@rwi-essen.de*

1 Introduction

In times of economic downturn, collective redundancies are a common policy to reduce costs and maximize profits (see e.g. Farber, 2005; Blau, 2006). However, an employer is not entirely free in his decision whom to dismiss as most European governments[1] protect certain individuals from unemployment. That is, politicians force employers to regard explicit selection criteria in their dismissal decision.

The following example gives an insight into the process of collective dismissals in Germany: In the preparation of a collective redundancy, the employer has to select a group of comparable individuals who are allowed to be dismissed.[2] Then, within this group of workers, the employer has to select the individuals who are to be laid off. Here, the employer has to compare the individuals with regard to the selection criteria (age, disability, dependencies and tenure). In practice, the employer constructs a ranking of the individuals, where each selection criteria is attributed a certain amount of protection points. Regarding the employee's characteristics, the protection points are added up to obtain the employee's individual score. After the employees are ranked according to their scores, the individuals with the least protection points are dismissed first. By proposing selection criteria, politicians decide to protect subgroups of the population from the negative consequences of unemployment. However, ex ante it is not immediately clear how to appropriately weight the selection criteria against each other.

Against this background, this study's main contribution is the development of a procedure to derive an empirical based weighting scheme. In order to do so, it analyzes the extent to which individuals who fit the selection criteria (older *age*, higher *handicap level*, *dependencies* and higher *tenure*) suffer in terms of reemployment probabilities and wages in the new job. Then, the relevance of the outcome variables is compared from an individual perspective by estimating the correlation of income and the event of reemployment with life satisfaction. Finally, the marginal rates of substitution between the selection criteria are calculated. Hence, a weighting scheme based on the empirical estimates is derived which serves as a potential guideline for policy makers, employers, employees and unions. To the author's best knowledge, this study is the first to suggest a procedure to derive an evidence- and empirical-based weighting scheme.

This study focuses on two outcome variables. First, the reemployment probability

[1] E.g. Germany, France, Belgium, Italy, Portugal, Ireland, Netherlands, Luxembourg, Bulgaria, Estonia, Cyprus, Poland or Slovenia.

[2] Some individuals are protected by law and are not put at risk of dismissal, e.g. pregnant women or workers with a temporary contract.

is analyzed which is argued to be the main objective from a policy perspective of dismissal protection schemes. Faster reemployment implies less public transfers to the unemployed and sooner contributions to the social security system through taxes and insurance payments. Therefore, reemployment should be the ultimate goal of dismissal protection from a public perspective. Second, the quality of the new job, measured in terms of wage, is analyzed. It is argued that if policy makers force individuals to become reemployed faster this might come at the costs of wage hits. Individuals are forced to take up jobs with lower wages; they would not have taken up otherwise. As a result, faster reemployment implies high individual costs if it is associated with lower earnings. Therefore, both dimensions are important when deriving an empirical based weighting scheme.

The negative relationship between age and the reemployment probability is common knowledge. However, most studies analyze the effect of age at the mean of its distribution (e.g. Groot (1990), Mazerolle and Singh (2004) or Muhleisen and Zimmermann (1994)). Ex ante it is not clear whether the negative correlation exists across the whole distribution or only for higher ages. In terms of wage hits one would expect that younger individuals will change jobs in order to receive a wage benefit, to climb up the career ladder. However, elderly individuals might be forced to change their occupation when becoming unemployed. Those who worked in jobs with high physical demand might not be able to work in their occupation and will be forced to take up a different job where their marginal productivity is lower.

Handicapped people are already disadvantaged in their employment probability (see e.g. Acemoglu and Angrist, 2001). Sciulli, Menezes, and Vieira (2012) for Portugal and Chan and Stevens (2001) for the US find that once the handicapped become unemployed, their reemployment probability is even lower. At the same time the employment of handicapped people is heavily subsidized by the public system in Germany.[3] Muhleisen and Zimmermann (1994) find a positive, insignificant relationship between handicap and reemployment in Germany. Thus, the ex ante disadvantage of the handicapped in terms of reemployment and wage might already be compensated by political intervention.

Household composition implies additional stress for the newly unemployed workers. As Mazerolle and Singh (2004) or Jenkins and Garcìa-Serrano (2004) argue, dependents imply financial obligations that accelerate reemployment. Alba-Ramirez (1999) and Bukowski and Lewandowski (2005) find a positive correlation between marital status and reemployment. Once the breadwinner of the family becomes unemployed, the financial pressure on the household is high. As a result, it is argued that the

[3]See *SchwbAV §26*. The employer is e.g. eligible for financial support regarding the equipment of the workplace. Furthermore, he/she can obtain subsidies for the payment to the employee.

individual has a strong incentive to become reemployed faster even at the cost of lower wages. In contrast, Mazerolle and Singh (2004) mention that the financial support of a married spouse decreases the financial pressure on the individual resulting in a lower reemployment probability as individuals are enabled to afford the costs for a longer search for better (paid) jobs. Overall, the literature leads to ambiguous conclusions.

Individuals with a high tenure have a high amount of human capital that might be beneficial for reemployment. However, this human capital is likely to be job specific and thus is not transferable to a new employer. As a result, those with high tenure also have a high reservation wage when unemployed and, if they aim to maintain their wage level, might have a low reemployment probability. So far, empirical studies (Alba-Ramirez (1999), Johnson and Mommaerts (2011) or Gibbons and Katz (1991)) find that higher tenure in the previous job reduces the probability of reemployment.

Using micro data from the German Socio-Economic Panel (SOEP), the focus of the paper is on the German labor market. First, the German labor market is of special interest, as all the four selection criteria are applied in Germany. Second, the German labor market is the largest in Europe, delivering a sufficient amount of observations. When analyzing reemployment probabilities duration analysis models are applied. Here, the relationship between the unemployment duration and the reemployment probability is modeled. Furthermore, the study controls for the many right-censored observations in the data, i.e. individuals who drop out of the sample before they become reemployed. For the analysis of the job quality the applied econometric method is ordinary least squares.

The results show considerable differences in reemployment probabilities and job quality with respect to the selection criteria. The results hint at thresholds for age and tenure where no statistically significant relationship can be found below the thresholds. Disability and the status of an unmarried parent are negatively associated with reemployment. Then, it is argued with the use of life satisfaction analysis, that the event of reemployment is more important from an individual perspective than quality of the new job. Thus, a weighting scheme for the characteristics is derived based on the empirical estimates of the model for reemployment probabilities only. Finally, the empirically supported weighting scheme is compared to an already approved weighting scheme from the German federal labor court and differences can be identified.

2 Data

For the empirical analysis, micro data from the German Socio-Economic Panel (SOEP) is used. A questionnaire is asked on a yearly basis since 1984. About 20,000 individuals from about 11,000 households are asked for a variety of individual characteristics. For a detailed description of the data see Wagner, Frick, and Schupp (2007).

The present paper focuses on the years 1991 to 2010.[4] As the reunification changed the economic conditions for all Germans considerably, pre-reunification years (before 1991) are excluded from the analysis. Only individuals aged between 20 and 58 are included. After the age of 58, individuals are excluded from the analysis for two reasons. First, it is unclear whether the individuals participate in some kind of early retirement scheme.[5] Second, individuals might use unemployment as a bridge until they reach early retirement.[6] In both cases, the reemployment probability is low and future wages are less likely to be observed. As a result, the estimates might be biased if these individuals were included. The sample only includes individuals who enter unemployment within the sample period. In total, the sample for the analyses of reemployment probabilities consists of 2,533 individuals (44,611 person-month observations). The sample for the analysis of job quality includes only those individuals who became reemployed and for whom income information can be observed in the old and new job (1,813 individuals).

For the analysis of reemployment probabilities, the dependent variable is a dummy that equals one if an individual becomes reemployed and zero if not. It is assumed that the individual becomes reemployed if he/she changes his/her labor market status from unemployed to part- or fulltime employment. As the SOEP includes recursive calendar information about the individual's labor market status in each month of the last year, the exact month when the individual enters unemployment and becomes reemployed is known. Thus, one is able to calculate the duration of unemployment on a monthly basis. Descriptive statistics of the probability of reemployment and the duration of unemployment are shown in Table 2. About 80% of the sample becomes reemployed while the mean unemployment duration is about 18 months (median of ten months). When the quality of the new job is analyzed, the dependent variable

[4]The data used in this paper was extracted using the Add-On Package PanelWhiz for Stata. PanelWhiz (http://www.PanelWhiz.eu) was written by Prof. Dr. John P. Haisken-DeNew (john@PanelWhiz.eu). See Haisken-DeNew and Hahn (2010) for details. The PanelWhiz generated DO file to retrieve the data used here is available upon request. Any data or computational errors in this paper are the author's.

[5]Until 2007 individuals were able to use the so called "*58er Regel*". This rule, enabled older workers to withdraw conclusively from the labor market at age 58.

[6]See Giesecke and Kind (2013) where the behavior of individuals who become unemployed shortly before retirement is examined.

is logarithm of the monthly labor income in the new job. Table 2 shows that the mean of the wage gap (wage in the new job minus wage in the old job) is 4.59 which suggests that there is on average no wage differential in the sample.

Table 2 about here.

Of special interest in this paper are the effects of age, disability, household composition and tenure on the reemployment probability. As such, variables for each of these characteristics are included as explanatory variables.

In order to examine the effect of age on the reemployment probability, dummies for separate age groups are included. Table 3 shows the results derived with a 5–year interval in age (20-24; 25-29; 30-34; 35-39; 40-44 (reference group); 45-49; 50-54; 55-58).[7] In contrast to most of the existing literature (e.g. Groot (1990) or Mazerolle and Singh (2004)), age is not included as a continuous variable. By including dummies for different intervals, no assumption has to be made about the shape of the relationship. While other studies as e.g. Alba-Ramirez (1999) for Spain, Johnson and Mommaerts (2011) for the US or Frosch (2006) for Germany also include dummies for different ages, they neglect testing for significant differences between the different age dummies.

The handicap level and the disability status are also included in the regressions. The handicap level describes by how much an individual is physically, mentally or emotionally handicapped in his everyday life. The SOEP asks this question[8] directly and the respondents answer on a 0-100 scale. The level of handicap is officially determined by a medical doctor. In order to compare the results to previous studies, a dummy indicating whether the individual is regarded as disabled (handicap level above 30)[9] is included in the regressions. Chan and Stevens (2001) include two dummy variables. One dummy indicates whether the individual has a disability that affects his/her ability to work. The results indicate a one-third lower reemployment probability for the disabled. The other dummy variable they include reflects the individuals' self-rated health. Here it can be seen that the reemployment rate is decreased by about 50% when an individual reports being in bad health.

The selection criteria required in German law also include the presence of dependents. Three dummy variables are included in the regressions which represent three

[7] A continuous variable and different age intervals (7-year groups, 10-year groups and 15-year groups) are included as robustness checks. The results remain qualitatively the same.

[8] "Are you legally classified as handicapped or capable of gainful employment only to a reduced extent due to medical reasons?" If this question is answered with yes, the individual is asked the following: "What is the extent of this capability reduction or handicap according to the most recent diagnosis?".

[9] A definition of disability can be found in German social security law (*Sozialgesetzbuch IX §2*).

distinctive cases. While being a childless single serves as a reference group, the three included dummy variables indicate the status of an unmarried parent, a married non-parent and a married parent. The dummy variable is equal to one if the individual had the relevant status before he/she entered unemployment. By doing so, possible differences between single parents and other family compositions can be identified.

The analysis also controls for tenure of the individual in the old job. In this study, comparable to the age-variable, no specific functional form of the relationship is assumed. Dummy variables indicating 2-year intervals (0-1 (reference group); 2-3; 4-5; 6-7; 8-9 and 10 and above) are included on the right hand side. Alba-Ramirez (1999) includes tenure dummies in monthly intervals in his analysis of the Spanish labor market. He finds a negative relationship between reemployment and tenure, for tenure above one year. Here, additional robustness checks are run with a continuous variable for tenure and 3-, 5- and 10-year intervals.

Standard controls used in the analysis are the level of education, migration background, living in West Germany, the regional unemployment rate on the state level, past unemployment experience, work experience, the household income before the individual entered unemployment and a dummy variable that controls for the case that the individual became unemployed due to company closure. Furthermore, year dummies are included to control for year fixed effects. Descriptive statistics of the standard controls are displayed in Table 2.

3 Empirical Approach

For the analysis of the reemployment probability, duration analysis is the econometric method applied in this paper. It is chosen for two reasons: First, the sample contains right-censored observations. Individuals enter the sample once they become unemployed. Then, the individuals are followed throughout their unemployment spell until they either become reemployed or drop out of the survey. If an individual drops out of the survey, one cannot determine when his/ her unemployment spell is going to end. The only information that can be inferred is that the unemployment spell lasted at least until the dropout of the sample. As such the information is right-censored. It would not be sufficient to estimate simply the reemployment probability via OLS in which the information contained in the right-censored spells would be ignored. Thus, the results would be inefficient and potentially inconsistent (see Kiefer (1988) for further explanations). Second, there is no independence between the event (reemployment) and time (unemployment duration). As argued in the literature (e.g. Nickell, 1979; Lancaster, 1979) the reemployment probability

depends on the time already spent in unemployment. The longer an individual is unemployed the lower the reemployment probability. As duration models incorporate a time-event relationship, they are the tool to be used.

The duration model used is based on three assumptions: First, a proportional hazard is assumed. Here the reemployment probability λ that is estimated, consists of two parts λ_0 and ϕ:

$$\lambda(\lambda_0, t, x, \beta) = \lambda_0(t) * \phi(x, \beta) \tag{1}$$

There is a baseline hazard of reemployment λ_0 that solely depends on time. This part of the equation represents the dependence of time and event (baseline hazard); it is the same for every individual and only varies over time t. The second part of the equation ϕ is the scale factor of the baseline hazard and varies with the characteristics x of the individual. The baseline hazard is proportionally shifted by a one unit change in x according to the estimated hazard ratio e^{β}. The second assumption is that time is measured as a continuous variable, based on monthly data. Third, the covariates are fixed to their values at the point when the individual enters unemployment, i.e. time invariant covariates are assumed. It is argued that these are the "policy relevant" characteristics. When the employer has to select the employees he wants to dismiss, he takes these characteristics at this moment into account.[10]

The applied model is a fully parametric model, which needs a distributional assumption for the shape of the time-event relationship.[11] While several different distributions are possible, the correct one cannot be verified by statistical tests. However, one can apply several distributions to the data and then compare the fit of the model. The model with the best fit in terms of the log-likelihood is chosen. Here the AIC-criterion, which also takes the number of independent variables into account, allows for a proper comparison. In this paper, the Weibull distribution is assumed. Here it is assumed that there is a non-linear, either positive or negative, duration dependence. As mentioned above, it is very likely that there is negative duration dependence (i.e. the longer the unemployment spell the lower the reemployment probability). This negative duration dependence is supported by the model.[12]

One might assume that unobserved heterogeneity affects the results. This could be

[10] In only about 0.9% of the cases an individual's disability status changes during the unemployment spell. Furthermore, the presence of a family changes in only 3% of the examined unemployment spells. Thus, applying time invariant independent variables is expected not to change the results.

[11] As a robustness check the estimation is rerun with a COX-Model. The results are available on request.

[12] In the Weibull model, the Weibull parameter ρ in table 3 is smaller than one. This supports the assumption of negative duration dependence.

e.g. if the sample consists of both highly motivated individuals who should have a higher reemployment probability and less motivated individuals who have a smaller reemployment probability. If motivation is unobserved and correlated with any control variable of the model, the results would be inconsistent. One approach to solve the problem of unobserved heterogeneity within the framework of duration models is applying so called frailty models.

One has to make an assumption of the distribution of the unobserved heterogeneity. Here, the inverse Gaussian distribution is chosen. The implicit assumption of the inverse Gaussian distribution is that the level of heterogeneity decreases over time (Gutierrez, 2002). Referring to the example mentioned above this would mean that the highly motivated individuals will become reemployed much faster than the low motivated. As such, the sample will consist of relatively more low motivated individuals over time as the high motivated enter reemployment.

For the analysis focusing on the quality of the new job a simple OLS estimation is run. Here, the data has a cross-sectional character as there is only one observation per reemployed individual. The dependent variable is the logarithm of the wage in the new job. The independent variables include the characteristics of the individual at the point in time when he/she became unemployed and the logarithm of the wage in the old job. Thus, the coefficients of the selection criteria can be interpreted as the relationship between e.g. age and the wage in the new job conditional on the wage in the old job. Unfortunately, the lay out of the data does not allow controlling for unobserved heterogeneity by e.g. a fixed-effects framework. Thus, the best that can be done is the inclusion of all relevant independent variables.

4 Results

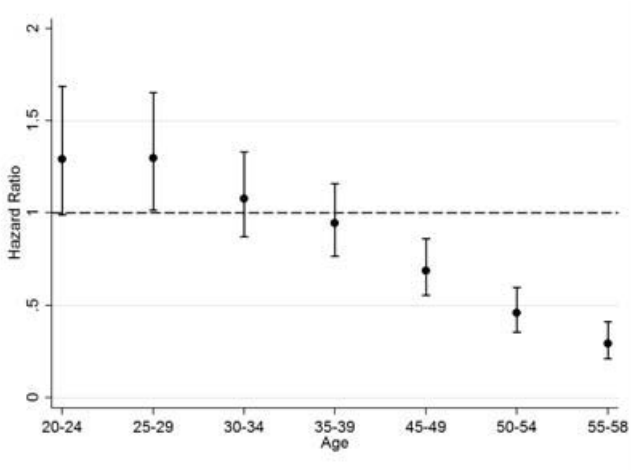
The following section presents the results of the empirical analysis. Each regression includes all control variables mentioned in section 2. In addition, the problems of the empirical strategy are discussed and further checks of the data are presented.

4.1 P(Reemployment) and Job Quality

In column one and two in Table 3 it can be seen that the hazard ratios for the age intervals below 30 are greater than one and statistically significant. T-tests conducted in order to test for equality of coefficients confirm that the hazard ratios are not significantly different until the age of 40, whereas starting with the hazard ratio of the age dummy 45-49, the hazard ratios are statistically different.

This suggests that until the age of 40, there is no relationship between age and reemployment probability. Thereafter a negative relationship can be identified. One can conclude that there is a plateau regarding the hazard ratios until the age of 40 and afterwards a drop in reemployment associated with continuous aging (see Figure 1). While this result is in contrast to the findings of e.g. Alba-Ramirez (1999), Jenkins and Garcìa-Serrano (2004) or Frosch (2006) who find a negative relationship across the whole age range using dummy variables[13], there is one paper that finds something similar for men only (Johnson and Mommaerts, 2011).

Figure 1: Hazard ratio and the 95% confidence interval



Note: Coefficients and confidence intervals are drawn from column one in Table 3.

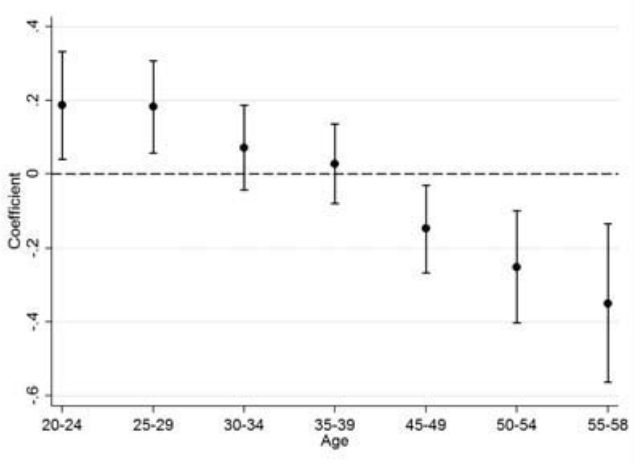
The relationship between age and job quality is displayed in Figure 2. Here, a negative relationship appears to be present. The results in column three and four in Table 3 suggest a positive relationship between age and the wage in the new job until the age of 30. This positive relationship shows that individuals in lower ages have it easier to find a new job that is better paid than their old job. However, after the age of 40 individuals suffer on average in terms of wages (their wages are up to 35 percentage points lower) when they change their job. A continuously negative relationship can be found for the age groups above 40.

A possible explanation for the negative relationship between age and the probability of reemployment above the age of 40 could be that with an increasing age, the individuals move closer to retirement. Thus, the employer might be less willing to invest in those employees (supported by the lower wages in the new job); as the time that individuals can work until retirement reduces as they become older (see Johnson

[13]They do not mention whether the coefficients are significantly different from each other. They only test, whether the coefficients are significantly different from zero.

and Mommaerts, 2011). According to Table 3, individuals above 40 do not only have greater problems to find a job but they also take a large wage hit once they find a new job.

Figure 2: Coefficients and the 95% confidence interval



Note: Coefficients and confidence intervals are drawn from column three in Table 3.

Two different variables are included in the models in order to examine the relationship between handicap (or health) and reemployment. As can be seen in Table 3, the handicap level has a negative and significant relationship to the reemployment probability. According to column one, one additional point on the handicap scale is associated with a one percent lower reemployment probability. In contrast to Muhleisen and Zimmermann (1994), who do not find a significant effect, this study finds that an individual who is classified as disabled is about 40 percent less likely to become reemployed. The negative correlation of disability and reemployment probability might be explained by a lower employment probability per se. As e.g. Acemoglu and Angrist (2001) show, disabled people have a lower employment probability than non-disabled. As such, it seems likely that unemployed individuals who are disabled (with a higher handicap level) also suffer in terms of the reemployment probability. Sciulli, Menezes, and Vieira (2012) investigate how the reemployment probability is modified by disability. Their micro data from Portugal even allows distinguishing the exact type of disability. Thus, they are able to identify that speech, disfiguring, general function disorders and muscle-skeletal problems lower the reemployment probability. As the reason for the lower reemployment probability, lower returns to the characteristics are mentioned. That is to say, disabled persons have lower job opportunities because employers assume a lower expected productivity.

This explanation is somewhat supported by the empirical results concerning the wage in the new job in column three and four. As employees expect lower productivity the

disabled are more likely to receive a lower wage in their new job (about 11 percentage points lower). However, the result is not statistically significant.

Referring to the family characteristics, one can see that an unmarried parent is less likely to become reemployed compared to an unmarried non-parent. The presence of children is associated with a 20 percent lower reemployment probability. Being married in the year before entering unemployment does not show any significant relationship for both parents and non-parents, which contradicts the positive relationship found by e.g. Bukowski and Lewandowski (2005) or Johnson and Mommaerts (2011).

A possible explanation for the negative correlation between being an unmarried parent and the reemployment probability (column one and two in Table 3) could be that an unmarried non-parent faces fewer restrictions on the labor market than an unmarried parent. These restrictions, as e.g. time and spatial inflexibility hinder the individual to find a new job. As a result, it takes longer to find a new job and the duration of unemployment increases.

Column three and four indicate that being married and/or a parent leads on average to a somewhat lower wage in the new job (not statistically significant).

In line with Alba-Ramirez (1999), Gibbons and Katz (1991) and Johnson and Mommaerts (2011) a negative relationship between tenure and reemployment is found. More tenure is associated with lower reemployment probability. The only statistically significant hazard ratio can be found for the interval of more than ten years of tenure. Thus, only those individuals, who had a very strong attachment to their previous employer, are less likely to become reemployed. A possible explanation for the negative relationship between tenure and reemployment probability could be the relationship between tenure and income. Seniority is one major determinant of income. Farber (2005) argues that individuals with high seniority in the last job accumulated a high amount of job specific human capital. This results in a relatively high wage in the former job. Therefore, individuals with a high tenure in their former job potentially have a high reservation wage. However, the returns to the job specific human capital in a potential new job are typically relatively low. As a results, individuals with high tenure need more time to find a new job which matches their reserveration wage. The results in column three and four indicate that this longer time until reemployment is well invested, as no significant wage decrease in the new job can be detected for the individuals with high tenure. In contrast, individuals with low tenure (two to three years) seem to benefit in their future job in terms of wages (not statistically significant).

The results found in column one and two in Table 3 are robust to the assumption of unobserved heterogeneity. Table 4 shows the results of a frailty model that is

supposed to control for unobserved heterogeneity. It can be seen that the results remain qualitatively the same. In terms of size the effects become slightly larger but the overall picture does not change.

4.2 Further Remarks

The present paper analyzes the extent to which recently unemployed individuals suffer in terms of reemployment probability and job quality, even though they are protected by law. It is examined, whether characteristics the employers are forced to regard in the case of collective redundancies are associated with disadvantages on the labor market. As such, it is not the aim of this paper to evaluate the efficiency of dismissal protection. This study does not compare the existing rule with the counterfactual situation of unprotected individuals. Doing so, it cannot be concluded whether individuals who entail the selection criteria are worse or better off due to the protection.

Kugler and Saint-Paul (2004) or Addison and Teixeira (2003) argue that employment protection imposed through the selection criteria hinders employers to hire individuals who are subject to the selection criteria. If there is a vacant position to be filled, employers fear the difficulties of a future dismissal of the "protected". As a result, protected individuals have a lower reemployment probability due to employer's fear of potential costs.[14] Thus, the results derived in section 4 might be affected by the selection criteria themselves. However, this study still fulfills its descriptive goal. Whether the reemployment probability of the elderly, handicapped, with a family or workers with high tenure is lower due to law or due to the characteristics themselves is not the topic of this study. This study explores the disadvantage of individuals with these characteristics in the presence of employment protection.

A possible counterfactual for a world without dismissal protection could be employment with a temporary contract. Individuals with a temporary contract are usually exempted from the group of comparable workers. As they already have a time limited contract, they cannot be dismissed before the end of the contract. As such, it is assumed that the employer's fear of future dismissal costs, as it is mentioned above, should not be present in this case. The selection criteria should not influence the reemployment probability for jobs with a temporary contract via the fear of the employer of higher dismissal costs. As a robustness check of the results, the estimations

[14] Bauer, Bender, and Bonin (2007) examine changes in the threshold scale that determines whether small firms have to apply dismissal protection in Germany. Their results indicate that dismissal protection does not impact the employment behavior.

are rerun in a competing risk framework.[15] The probability to become reemployed with a temporary contract conditional on not becoming reemployed or not becoming reemployed with a permanent contract yet is estimated. Table 5 shows that the results change in significance but not qualitatively. The negative relationship between age and P(Reemployment) is supported for individuals older than 40. Handicapped and disabled individuals are less likely to become reemployed. An overall negative relationship of tenure and P(Reemployment) can be detected. As such, it is concluded that the results found in section 4 hint at the original disadvantage of individuals with the selection criteria on the labor market.

Alternatively Mazerolle and Singh (2004) argue that protected individuals are aware of their disadvantage on the labor market. Thus, they look for possible alternatives. Mazerolle and Singh (2004) state that self-employment could be one of them. The analysis run above is rerun with self-employment as the competing risk. Column three and four in Table 5 presents the results. It can be seen that the results remain qualitatively and quantitatively roughly the same. Thus, regarding the alternative of self-employment for the now unemployed worker does not change the results. The results derived in section 4 are robust.

5 Protection Point System

In the analysis above, two dimensions have been analyzed: reemployment probability and job quality. The next step is to derive an evidence based point scheme as a benchmark for future collective dismissal decisions. From a public policy perspective one would argue that the reemployment probability should be of prior interest. Individuals, who become reemployed faster, rely for a shorter period of time on public transfers and will start earlier to contribute to the social security system via tax payments. In contrast, one could argue that job quality is one major objective from an individual's perspective. Individuals aim at avoiding e.g. wage hits in order to maintain their standard of living. As a result, the question arises which of the two dimensions should be regarded within the point scheme.

To come up with an empirically based suggestion, a life satisfaction equation similar to Kassenboehmer and Haisken-DeNew (2009) is run. SOEP data is used and the sample is restricted to individuals who were unemployed in $t-1$ and are between 20 and 58 years old. The left hand side variable is life satisfaction measured on an eleven-point scale (0 means "completely dissatisfied" and 10 stands for "completely satisfied"). The right hand side controls for several standard controls, household

[15] The competing risk model suggested by Fine and Gray (1999) is applied.

income and the case of reemployment (compared to staying unemployed). The estimation is run using an individual fixed-effects framework with robust standard errors. Table 6 shows the results. It can be seen that both income and the case of reemployment are positively correlated with life satisfaction. The point estimates of the logarithm of household income suggest, that a one percent increase in household income leads to a 0.0045 increase of life satisfaction on the eleven-point scale. The case of reemployment is associated with an increase of life satisfaction by about 0.6 points on the eleven-point-scale. As a result, one could argue that the case of reemployment is also from an individual perspective relatively more important than an increase in income. Thus, in the following the derivation of the weighting scheme is based on the empirical estimation of the reemployment probabilities only.

Table 6 about here.

When the employer has to decide about whom to dismiss in a collective redundancy, he/she has to apply the selection criteria examined in section 4. While a specific ranking of the individual criteria amongst themselves is not implied by German law, in practice a point system is applied where the employer is free to choose a weighting scheme. In reality he/she bargains with the workers council and/or union to determine a socially acceptable scheme. Here, a certain amount of protection points is attributed to each characteristic, then for each worker the protection points are added up and the employees with the least protection points will be dismissed. In the past, German federal labor courts had to evaluate several applied protection point systems.[16]

Column one of Table 1 shows that according to established point schemes age and tenure are of high value. The marginal rate of substitution[17] between one additional year of age and having a child is three. That means that an individual being 30 and having no children has to be compared to an individual being 27 and having a child. The results derived in section 4 imply that this is not appropriate. An age difference between 27 and 30 does not affect the reemployment probability, whereas being an unmarried parent significantly reduces the reemployment probability by about 18% due to reduced flexibility. Thus, the protection point system suggested by the cited judgment is not supported by the empirical results.

The results derived in section 4 allow calculating marginal rates of substitution between the characteristics. Thus, one is able to calculate e.g. the number of years one

[16]See for example in the revisions of the German federal labor court: *Bundesarbeitsgericht 2 Revision 357/89* or *Bundesarbeitsgericht 2 Revision 812/05*.

[17]Here, the marginal rate of substitution is defined as the change in variable X that is needed to compensate one unit change in Y in order to maintain the same reemployment probability.

Table 1: Comparison of the Protection Point Schemes

	Suggested by *Bundesarbeitsgericht 2 Revision 812/05*	Suggested by section 4
Age:	Each year counts for one protection point, where the upper limit is 55.	Age only matters for individuals older than 40. Here, one additional year counts for one point eight protection points.
Disability:	Having a handicap level of 50% counts for five protection points, above that each 10% means one additional protection point.	Being disabled counts for ten protection points. Alternatively, each additional 10% of handicap level imply two point seven protection points.
Dependencies:	Each child means three protection points and being married implies four protection points.	Being an unmarried parent counts for four point four protection points
Tenure:	Up to ten years of tenure each year counts for one protection point. Above ten years of tenure each year counts for two protection points.	Tenure is only regarded if an individual has more than ten years of seniority. Each additional year of tenure counts then for zero point six protection points.

Note: The firm selects a group of workers that can potentially be dismissed. Within this group of workers, each worker is assigned a certain amount of protection points based on his characteristics. Then, a ranking of the workers is constructed. Beginning with the workers who have the lowest amount of protection points, the collective redundancy process starts.

needs to be younger to compensate for being disabled in order to maintain the same reemployment probability. Assuming that being disabled is equal to ten protection points, the marginal rates of substitution imply the protection point scheme shown in column two of Table 1.

Several derivations from the protection point scheme suggested in *Bundesarbeitsgericht 2 Revision 812/05* can be seen. First of all, the two thresholds for age and tenure are not suggested by the German federal labor court. In addition, the handicap level/disability statuses are shown to be of relatively greater importance regarding the empirical results. Finally, being married and having children should not be regarded separately. Instead, being a parent and not married is especially relevant for protection.

The question arises whether these two different protection point schemes would lead to different dismissal decisions. Applying both point schemes to the employed individuals in the SOEP and normalizing each scale to the minimum of zero and the maximum of 100, enables to compare the two point schemes. Here, the mean of the protection point scheme suggested by *Bundesarbeitsgericht 2 Revision 812/05* is about 50.7 whereas the mean of the empirically derived protection point scheme is about 40.

To obtain some intuition of the distribution of protection points within different groups of German society, the following exercise is done: According to both protection point schemes, employees in the public sector have on average a higher amount of protection points compared to workers in the non-public sector. Also individuals in firms with more than 250 employees entail on average a higher number than individ-

uals in firms with less or equal to 250 employees. In terms of industry, both schemes suggest that the sum of protection points is the highest in physically demanding industries such as mining. The empirical suggested protection point scheme identifies a high point average also in education. According to both schemes, the protection point average is relatively low in the service, restaurant or wholesale sector.

The distribution of protection points across the working population in each federal state in Germany is shown in Table 7. It can be seen that the two schemes deliver quite similar results (the product-moment correlation coefficient of the rankings is about 0.63). Individuals who accumulate a high amount of protection points are likely to be found in Saarland. The states with the lowest protection point average are Hamburg or Bremen. However, large differences can be found for Rhineland-Palatinate whose population is strongly protected by the point scheme suggested in *Bundesarbeitsgericht 2 Revision 812/05*. According to the established point scheme it is ranked second whereas the evidence based point scheme would suggest Rhineland-Palatinate to be ranked number ten. This suggests, that due to political reasons, citizens of Rhineland-Palatinate are attributed a higher amount of protections points than the empirical results would suggest. Once citizens of Rhineland-Palatinate enter unemployment, they do not suffer as much in their labor market outcomes as e.g. citizens from Berlin. However, they are much more protected from the entry into unemployment under the established point scheme. In contrast, Berlin and Mecklenburg-West Pomerania have a higher protection point average applying the empirical derived point scheme. According to the evidence based point scheme, these states should be ranked on position three and five. However, the established point scheme ranks them on position eleven and twelve. Even though, citizens from these states take a relatively large hit (low reemployment probability) once they enter unemployment, the established point scheme does not protect them accordingly. Thus, the approved point scheme in *Bundesarbeitsgericht 2 Revision 812/05* fails to protect the citizens from Berlin and Mecklenburg-West Pomerania, who have a higher need to be protected from unemployment.

6 Conclusion

A widespread policy in the EU is to protect certain subgroups of the population from unemployment. When a company lays off workers in a collective redundancy, certain criteria have to be regarded to select those who become unemployed first. Most European countries require the employers by law to select by age, disability, dependencies and/or tenure. This study contributes to the literature by developing

a procedure to generate a weighting scheme between the characteristics based on empirical estimates of reemployment probability and quality of the new job. The derived weighting scheme relies on objective empirical estimates and can serve as a benchmark in the process of collective redundancies.

Applying data from the SOEP for the years 1991-2010, differences in reemployment probabilities and the quality of the new job (measured in terms of wage) that are related to the selection criteria are assessed for individuals aged between 20-58. Then, the impact of reemployment and income is compared within a life satisfaction framework. Finally, the marginal rates of substitutions between the selection criteria are derived and a weighting scheme is constructed.

Compared to formerly applied and approved weighting schemes in Germany, this study generates a considerably different weighting scheme. First, thresholds in age and tenure can be found. Individuals below the age of 40 and with less than ten years of tenure do not suffer in terms of reemployment or job quality. Thus, age and tenure should not matter in the weighting scheme below these thresholds. Second, being a non-married parent is associated with lower reemployment probabilities, whereas being married does not lead to disadvantages in the two examined dimensions. Thus, the status of marriage should not lead to additional protection points.

In the majority of cases, these differences in point schemes do not lead to a mismatch in protection when comparing subgroups of the German population. However, for three federal states the differences between the applied and the evidence based point scheme can be argued to be of great importance. While Rhineland-Palatinate benefits from the established point schemes, citizens from Berlin and Mecklenburg-West Pomerania are not getting the support they need. The empirical results suggest that the average citizen from Berlin and Mecklenburg-West Pomerania needs to be relatively strongly protected from entry into unemployment. However, the established point schemes fail to do so. As a result, citizens from these two states have an unfair disadvantage on the labor market, i.e. the existing laws of the German government fail to create a level playing field.

When dismissed workers go to court and claim an unfair dismissal this is most often due to an, from their perspective, unfair weighting scheme. This paper contributes to the literature by suggesting a comprehensible procedure that generates a weighting scheme based on empirical estimates that can serve as a starting point in the negotiation between employers, unions and workers councils. Within the negotiation process the weighting scheme can be adjusted to the company's specific distribution of characteristics. However, as the empirical derived weighting scheme serves as a benchmark, there is a solid foundation for the applied weighting scheme. In the end,

this should lead to a higher degree of security in dismissal decisions.

From a European perspective the developed procedure could be integrated into the alignment process of collective redundancy procedures. According to the council directive 98/59/EC the member states of the European Union force employers to regard a specific guideline during the dismissal process of collective redundancies. Here, the developed procedure to derive a weighting scheme could be added. First, the relationships between the outcome variables (e.g. reemployment and job quality) and the characteristics of policy interest have to be estimated. Second, the valuation of the outcomes from an individual perspective should be compared. Finally, the marginal rates of substitutions between the characteristics should be calculated in order to generate an appropriate weighting scheme. The suggested procedure is flexible in terms of outcome variables and selection characteristics. Thus, it can be applied in each member state to propose an evidence based benchmark of the weighting scheme.

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7 Appendix

Table 2: Descriptive Statistics

	P(Reemployment)		Ln(Wage in New Job)	
	Mean	Std.Dev.	Mean	Std.Dev.
Becomes Reemployed	0.82	(0.38)		
UE Spell (Months)	17.61	(24.02)		
Wage Differential			4.59	(915.39)
Age: 20-24	0.18	(0.38)	0.19	(0.39)
Age: 25-29	0.16	(0.36)	0.17	(0.37)
Age: 30-34	0.15	(0.35)	0.16	(0.37)
Age: 35-39	0.14	(0.34)	0.14	(0.35)
Age: 40-44	0.11	(0.32)	0.12	(0.32)
Age: 45-49	0.11	(0.31)	0.11	(0.31)
Age: 50-54	0.09	(0.29)	0.08	(0.27)
Age: 55-58	0.07	(0.26)	0.04	(0.20)
Handicap Level	1.75	(8.99)	1.39	(7.86)
Disabled	0.03	(0.18)	0.03	(0.16)
Unmarried Non-Parent	0.37	(0.48)	0.38	(0.49)
Unmarried Parent	0.14	(0.35)	0.14	(0.35)
Married Non-Parent	0.20	(0.40)	0.18	(0.38)
Married Parent	0.28	(0.45)	0.30	(0.46)
Tenure (0-1)	0.64	(0.48)	0.66	(0.47)
Tenure (2-3)	0.15	(0.36)	0.16	(0.37)
Tenure (4-5)	0.05	(0.23)	0.05	(0.22)
Tenure (6-7)	0.04	(0.19)	0.03	(0.18)
Tenure (8-9)	0.02	(0.13)	0.02	(0.13)
Tenure (>10)	0.10	(0.30)	0.08	(0.27)
Company Closure	0.11	(0.32)	0.11	(0.32)
West Germany	0.60	(0.49)	0.60	(0.49)
Migration BG	0.20	(0.40)	0.19	(0.39)
Low Education	0.39	(0.49)	0.35	(0.48)
Medium Education	0.48	(0.50)	0.50	(0.50)
High Education	0.13	(0.34)	0.15	(0.35)
Reg. UE Rate	11.81	(4.72)	11.94	(4.72)
Past UE Experience	1.23	(1.94)	1.07	(1.72)
Log(HH Income)	7.65	(0.51)	7.66	(0.51)
Empl. Experience	11.72	(10.59)	10.98	(10.01)
N	2533		1813	

Note: Author's calculations based on SOEP (1991-2010).

Table 3: P(Reemployment) and Job Quality

	Dep.Var.: P(Reemployment)		Dep.Var.: Ln(Wage in New Job)	
	(1)	(2)	(3)	(4)
Age: 20-24	1.292*	1.298*	0.187**	0.184**
	(0.176)	(0.177)	(0.075)	(0.075)
Age: 25-29	1.296**	1.296**	0.182***	0.179***
	(0.161)	(0.161)	(0.064)	(0.064)
Age: 30-34	1.077	1.077	0.071	0.068
	(0.117)	(0.117)	(0.059)	(0.059)
Age: 35-39	0.944	0.945	0.028	0.024
	(0.099)	(0.099)	(0.055)	(0.055)
Age: 45-49	0.691***	0.692***	-0.148**	-0.149**
	(0.077)	(0.077)	(0.060)	(0.060)
Age: 50-54	0.462***	0.460***	-0.251***	-0.252***
	(0.061)	(0.061)	(0.077)	(0.077)
Age: 55-58	0.295***	0.296***	-0.349***	-0.351***
	(0.051)	(0.051)	(0.109)	(0.109)
Handicap Level	0.991***		-0.001	
	(0.003)		(0.002)	
Disabled		0.610***		-0.115
		(0.094)		(0.111)
Unmarried Parent	0.826**	0.827**	-0.059	-0.059
	(0.066)	(0.066)	(0.048)	(0.048)
Married Non-Parent	0.938	0.941	-0.037	-0.035
	(0.084)	(0.084)	(0.049)	(0.049)
Married Parent	0.953	0.956	-0.028	-0.028
	(0.070)	(0.070)	(0.042)	(0.042)
Tenure (2-3)	0.940	0.939	0.027	0.028
	(0.067)	(0.067)	(0.044)	(0.044)
Tenure (4-5)	0.966	0.968	-0.017	-0.016
	(0.105)	(0.105)	(0.069)	(0.068)
Tenure (6-7)	1.127	1.120	0.136**	0.135**
	(0.158)	(0.157)	(0.064)	(0.064)
Tenure (8-9)	0.816	0.815	-0.044	-0.046
	(0.155)	(0.155)	(0.127)	(0.127)
Tenure (>10)	0.709***	0.708***	-0.005	-0.004
	(0.082)	(0.082)	(0.058)	(0.058)
Ln(Wage in Old Job)			0.404***	0.406***
			(0.033)	(0.033)
Constant	0.048***	0.050***	3.093***	3.089***
	(0.024)	(0.025)	(0.341)	(0.342)
ln ρ	0.850***	0.850***		
	(0.014)	(0.014)		
SC	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
N	2533	2533	1813	1813

Note: Authors' calculations based on SOEP (1991-2010). *** p<0.01; ** p<0.5; * p<0.1. In column one and two, a parametric model is applied assuming a weibull distribution. Hazard ratios are reported. In column three and four coefficients of an ordinary least squares regression are shown. Robust standard errors in parentheses. Year dummies in all models. Standard controls included in all models: Becoming unemployed due to firm closure, living in West Germany, migration background, education dummies, regional UE rate, UE experience, HH income and empl. experience.

Table 4: Frailty Model: P(Reemployment)

	Dep.Var.: P(Reemployment)	
	(1)	(2)
Age: 20-24	1.458**	1.465**
	(0.278)	(0.279)
Age: 25-29	1.544**	1.544**
	(0.264)	(0.264)
Age: 30-34	1.106	1.108
	(0.166)	(0.167)
Age: 35-39	0.911	0.911
	(0.132)	(0.132)
Age: 45-49	0.588***	0.591***
	(0.092)	(0.092)
Age: 50-54	0.342***	0.341***
	(0.064)	(0.063)
Age: 55-58	0.174***	0.174***
	(0.042)	(0.042)
Handicap Level	0.986***	
	(0.005)	
Disabled		0.469***
		(0.106)
Unmarried Parent	0.749***	0.749***
	(0.084)	(0.084)
Married Non-Parent	0.906	0.911
	(0.113)	(0.114)
Married Parent	0.937	0.941
	(0.096)	(0.097)
Tenure (2-3)	0.875	0.873
	(0.088)	(0.088)
Tenure (4-5)	0.899	0.902
	(0.137)	(0.137)
Tenure (6-7)	1.087	1.081
	(0.204)	(0.204)
Tenure (8-9)	0.690	0.688
	(0.181)	(0.180)
Tenure (>10)	0.595***	0.593***
	(0.094)	(0.094)
Constant	0.023***	0.024***
	(0.016)	(0.017)
ln ρ	1.292***	1.292***
	(0.022)	(0.022)
ln θ	2.571***	2.572***
	(0.150)	(0.148)
SC	Yes	Yes
Year dummies	Yes	Yes
N	2533	2533

Note: Authors' calculations based on SOEP (1991-2010). *** p<0.01; ** p<0.5; * p<0.1. Estimation is run using a parametric model (weibull distribution) within a frailty framework (inverse gaussian distribution). Hazard ratios are reported in column 1 and 2. Robust standard errors in parentheses. Year dummies in all models. Standard controls: Becoming unemployed due to firm closure, living in West Germany, migration background, education dummies, regional UE rate, UE experience, HH income and empl. experience.

Table 5: Competing Risk Models

	Dep.Var.: P(Reempl. Temp. Cont.)		Dep. Var.: P(Reemployment)	
	(1)	(2)	(3)	(4)
Age: 20-24	1.449	1.440	1.130	1.132
	(0.374)	(0.372)	(0.133)	(0.133)
Age: 25-29	1.677**	1.664**	1.360***	1.361***
	(0.388)	(0.386)	(0.141)	(0.141)
Age: 30-34	1.792***	1.784***	1.093	1.094
	(0.363)	(0.362)	(0.104)	(0.104)
Age: 35-39	1.159	1.151	0.922	0.922
	(0.239)	(0.237)	(0.083)	(0.083)
Age: 45-49	0.733	0.730	0.782**	0.784**
	(0.172)	(0.171)	(0.076)	(0.077)
Age: 50-54	0.983	0.978	0.593***	0.592***
	(0.242)	(0.241)	(0.069)	(0.069)
Age: 55-58	0.327***	0.327***	0.361***	0.362***
	(0.130)	(0.130)	(0.057)	(0.057)
Handicap Level	0.994		0.995*	
	(0.006)		(0.003)	
Disabled		0.640		0.769**
		(0.204)		(0.097)
Unmarried Parent	0.701**	0.700**	0.835***	0.836***
	(0.106)	(0.106)	(0.057)	(0.057)
Married Non-Parent	0.837	0.840	0.879	0.880
	(0.137)	(0.137)	(0.070)	(0.070)
Married Parent	0.932	0.931	0.898*	0.900
	(0.121)	(0.121)	(0.058)	(0.058)
Tenure (2-3)	0.795*	0.796*	1.009	1.008
	(0.109)	(0.109)	(0.062)	(0.062)
Tenure (4-5)	0.413***	0.413***	1.006	1.007
	(0.117)	(0.118)	(0.098)	(0.098)
Tenure (6-7)	0.713	0.712	1.096	1.092
	(0.199)	(0.198)	(0.138)	(0.137)
Tenure (8-9)	0.639	0.636	0.798	0.798
	(0.251)	(0.250)	(0.138)	(0.138)
Tenure (>10)	0.393***	0.392***	0.807**	0.806**
	(0.097)	(0.097)	(0.077)	(0.077)
SC	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
N	2533	2533	2533	2533

Note: Authors' calculations based on SOEP (1991-2010). *** p<0.01; ** p<0.5; * p<0.1. All results are derived estimating a competing risk model. Models one and two have P(Reemployment with temporary contract) as a dependent variable and P(Reemployment permanent contract) as competing risk. Models three and four have P(Reemployment) as the dependent variable and P(Self-employment) as competing risk. Hazard ratios are reported. Robust standard errors in parentheses. Year dummies in all models. Standard controls included in all models: Becoming unemployed due to firm closure, living in West Germany, migration background, education dummies, regional UE rate, UE experience, HH income and empl. experience.

Table 6: Effect of Income and Reemployment on Life Satisfaction

	Dep.Var.: Life Satisfaction
Log(HH Income)	0.449***
	(0.058)
Becoming Reemployed	0.589***
	(0.040)
SC	Yes
Year dummies	Yes
N	12939

Note: Authors' calculations based on SOEP (1991-2010). *** p<0.01; ** p<0.5; * p<0.1. The results are derived using a linear fixed-effects within estimator. Robust standard errors in parentheses. Controls are added for age, age^2, family status, handicap level and the regional unemployment rate. Year dummies in all models.

Table 7: Average Amount of Protection Points per State

German Federal State	Rank according to *Bundesarbeitsgericht 2 Revision 812/05*	Rank according to section 4	Difference in Protection Points	Difference in Ranking
Saarland	1	1	2.7	0
Rhineland-Palatinate	2	10	7	-8
Schleswig-Holstein	3	6	4.1	-3
Hesse	4	7	4.2	-3
Saxony-Anhalt	5	4	3.4	1
North Rhine-Westphalia	6	9	6.8	-3
Brandenburg	6	2	2.4	4
Bavaria	8	11	6.2	-3
Saxony	9	8	4.5	1
Lower Saxony	10	13	6.4	-3
Berlin	11	3	1.1	8
Mecklenburg-West Pomerania	12	5	1.8	7
Baden-Wuerttemberg	13	16	6.4	-3
Thuringia	14	12	4	2
Hamburg	15	14	3.3	1
Bremen	16	15	3.3	1

Note: Calculations based on SOEP (1991-2010). The difference in protection points is estimated as protection points according to *Bundesarbeitsgericht 2 Revision 812/05* minus protection points according to section 4. Difference in ranking is derived by rank according to *Bundesarbeitsgericht 2 Revision 812/05* minus rank according to the point scheme derived in section 4.